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ABSTRACT

This proposal for the creation of a computer-assisted instructional (CAI) laboratory in a middle school in Oklahoma City emphasizes the need for such facilities to provide remedial instruction and improve student motivation as a means of reducing the number of students in the district dropping out of school before graduation. Intended for use by teachers of all content areas, the laboratory would stress computer literacy for both faculty and students as well as the improvement of basic skills. The laboratory would be equipped with IBM PC Jr. microcomputers, a printer, and software for both instructional purposes and for teacher use in developing tests, keeping records, and preparing reports. Four target audiences are identified: (1) students requiring remedial work, who would also receive instruction in computer literacy; (2) students needing supplementary work in the language arts, or students who would benefit from such enrichment activities as programming and problem solving; (3) students who request additional time in the laboratory for extra practice in class related activities; and (4) teachers wishing to use the laboratory for special presentations. The amount of time that would be allotted for each group is specified. This proposal also addresses the issue of equal access to computers for all students; lists potential learning experiences for both students and teachers; discusses staff training and special duties; and describes the proposed methodology for evaluation of the program through student test results and teacher and parent questionnaires. (DJR)

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Computer Assisted Instructional Laboratory (CAI) Proposal For An Urban Middle School

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Oklahoma City School District I-89
Jackson Middle School #515
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Awarded Spring, 1986
For The Ensuing School Term

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Herein is the Computer Assisted Instruction (CAI) grant proposal submitted to Oklahoma City School District I-89 Board of Education by Jackson Middle School on February 19, 1986.

Computer Implementation Plan

I. The Computer Education Program

A. Needs Assessment

A coalition of administrative and teaching professionals was formed to study the implementation of an on-site Computer Assisted Instructional (CAI) Laboratory at the middle school level. The specific needs planned to be implemented with this program will concentrate on the areas of remedial reading and mathematics, teacher training and computer literacy which culminate in the development of the most basic natural resource, the human intelligence.

The credo of the middle school concept, to facilitate the student attained maturation and academic levels, ordinarily allows for the student to be promoted unless, within just cause, it is shown not in the student's best interest; however, Oklahoma City School District I-89 statistically reports an excessive student dropout rate at the ninth grade high school level. This appears to relate to the preparedness of the student in terms of motivation and academic achievement.

Documentation presented at a national reading conference by the Nashville State Technical Institute, designed to host technical training programs for students possessing high school diplomas or GED certificates, indicated a reading range of ten or more grade levels (grades four or five to grades fifteen or sixteen) among its student population. To mitigate this, they developed a remedial program using computer assisted instruction to individualize student programs in the areas of Reading, English and Mathematics. Test results and grade point averages have shown the program to be successful. (Wares, 1971)

The coalition seeks to follow the example set by its sister middle schools through implementation of an on-site computer laboratory in an attempt to statistically improve the volume of high school level students receiving a diploma from Oklahoma City School District I-89. Furthermore, the coalition purports the use of computer instruction will strengthen their exertion to document student achievement as measured by the California Achievement Test percentile scores in terms of students reading on respective grade levels.

Other basic needs that may inspire further activity and learning through computer assisted instruction include the consistency of the computer to fairly disseminate information (nonjudgemental character), providing each student with individualized attention at his/her own pace excluding peer pressure, which is inordinately hard to achieve at the middle school level.

Data from questionnaires completed by faculty and staff members show a positive consensus toward computer assisted instruction.

1. Twenty-one percent of the members presently own home computers.
2. Twenty-eight percent of the members have experienced computer training.
3. Ninety-six percent of the members realize the value of computer education at the middle school level.
4. Eighty-seven percent of the members are willing to participate in computer education training.
5. Eighty-one percent of the members feel a computer laboratory would be of assistance in classroom management duties.
6. Ninety-six percent of the members are in favor of a computer laboratory installed as a permanent part of the curriculum.
7. One-hundred percent of the patronage is in favor of a computer laboratory installation becoming part of the curriculum.

If utilized, the expertise of this consortium will extend a real opportunity to many who otherwise have no access to computer technology.

B. Program Description

The computer laboratory will consist of the following hardware/software:

1. 15 IBM 4860/002 PC Jr. Units @ $650.	$9,750.00
2. 01 IBM 6412641 Proprinter (160 cps)	400.00
3. 01 IBM 1525612 Printer Cable	31.50
4. 01 IBM 0009 PC Jr. Unit Parallel Printer Attachment	79.20
5. Software	7,000.00
6. Shipping	300.00
	$17,480.70

Note: These costs include a 12 month warranty on all equipment.

The Computer Assisted Instructional Laboratory Program as detailed in the aforementioned program description will be used to teach computer literacy to the faculty as well as students. The coalition intends to foster a computer lab which will improve student reading skills as measured by California Achievement Test (CAT) Total Reading Percentile Ratings. The ultimate goal of the coalition is to create a computer lab for use by teachers of all content areas involved in seeking special solutions, experimenting with new concepts, or using CAI in simulation, drill and practice, educational games, a tutorial capacity, word processing activities or any other creative mode of expediting the educational processes.

Two computers will be placed on castered stands to maximize availability for individual instructional aide. To reduce possible damage on stairwells, one will service on the second floor checked out from room A200, the other will service the ground floor checked out from the media center.

Time must be provided for individual teachers to use the

laboratory when preparing tests and reports, recording grades, and a variety of other classroom management duties. Pre-existing software coupled with programs which are currently being developed can enhance student learning achievement as powerful database managers, priority sorters, homework organizers, and master schedulers. They can simulate the laboratory situation characteristic of Reading and Mathematics; they can augment Bilingual education. They can be used to coax the imagination of a student on a journey into the center of an atom or to the distant reaches of outer space.

1. Student Scheduling

Student Advisory Program (SAP) classes will receive basic classroom instruction and hands-on experience in computer literacy at regular intervals throughout the school term. During the time block provided for SAP, students will receive CAI or experience two days weekly thus allowing time for other activities on the remaining three days. The training sequence will be instruction followed by experience, further instruction followed by experience, continuing throughout the school term.

The coalition has identified four target groups which will be addressed respectively according to need and growth potential resulting from a computer laboratory installation. In every event student time-on-task will be prioritized.

The primary target group will be those students (grades six-eight) who score below the fortieth percentile on the CAT and are referred by their basic subjects teachers as needing remedial CAI. This group will be allotted three class periods per six period day during each semester. Students will work with the laboratory teacher during elective classes on basic grammar rules, spelling, reading, sequencing, problem solving and other activities which are amenable to CAI. Approximately 72 students from this group can be accommodated in the laboratory each semester, a total of 144 per year.

A second target group will be those students identified by their basic skills teachers to receive supplementary language arts skills and/or would benefit from enrichment activities such as programming, problem solving, etc. in the CAI Laboratory. Students would attend during their elective classes. Students classified in this group have scored slightly above the fortieth percentile on the CAT and will be perceived by their teachers as having such a need. The laboratory will be dedicated to this use for one period per six period day and approximately 48 students could be accommodated each semester, a total of 96 students per school term.

The third target group will consist of students who voluntarily request additional time in the laboratory. These students will receive extra practice in language arts, tutorial assistance, programming skills development and/or the opportunity to solve class related problems through use of the computer. Such problems could be those identified through science, mathematics, social studies or language arts classes. The laboratory will be available for this purpose for one period per day each semester. A total of approximately 96 students from

this target group could, thus, be served. However, such students would not necessarily attend the Lab for an extended period of time and a larger number could be accommodated through an open-entry/open-exit process.

The fourth target group is composed of teachers who elect to use the laboratory for presentation of material not available from other sources and/or for presentation of curriculum using more efficient or unique mannerisms during special projects. In these circumstances the laboratory is replete with value in science, mathematics, and economics instruction.

2. Laboratory Equity with Respect to Usage:

Oklahoma City School District I-89 endeavors to achieve its goal of further becoming a model urban school district through equity treatment of all employees (both certified and classified), patrons, constituents, and its student population. An equal educational opportunity is provided to its students regardless of race, sex, or economic background. This campus services the lowest socioeconomic student populous within the boundaries of District I-89; additionally, it will not be able to maintain the high educational standards of the district as established by district board policy until a computer laboratory facility is installed on site and becomes operational.

The plan to ensure access equity for students regardless of race, sex, or economic background is outlined in the student scheduling section. The SAP classes will provide access to everyone while the elective schedule of four hours per day and the open-entry open-exit schedule for one hour per day will allow maximum availability to all students.

3. Description of Potential Learning Experiences:

The coalition has adopted a professional objective of computer awareness for all faculty members so they will become involved in the implementation of microcomputers. Their training will make it possible for them to:

1. operate the hardware.
2. identify the different parts of the hardware and know how they operate.
3. familiarize with different types of software.
4. evaluate different types of software as to usability in their classrooms.
5. to do simple trouble-shooting while assisting students in operating software.
6. have information on various ways of using microcomputers as part of their instructional approach (Computer Assisted Instruction CAI and Computer Managed Instruction CMI,)

Furthermore, the coalition has adopted a professional objective of computer awareness for all students so they will become involved the implementation of microcomputers. A composition of educational goals and objectives pertaining to student progress have been divided into five areas of concentration.

A. The student will: develop a vocabulary of common

computer terms.

1. define and spell basic computer terms.
2. tell what a computer is and how it works.
3. differentiate among computers, calculators and electronic games.
4. differentiate among micro-, mini-, and main frame computers and identify the five major components of any computer.
5. define hardware and software and list two examples of each.
6. define "input" and "output" and give an example of each.
7. define the term "data base".

B. The student will: develop an understanding of how computers are used.

1. list several ways computers are used in everyday life.
2. identify ways that computers are used to help consumers.
3. describe how computer simulations are used in problem solving situations.
4. identify ways in which computers help make decisions.
5. explain how computers are used in predicting, interpreting, and evaluating data.
6. list several ways computers are used to process statistical data.
7. explain the meaning of "word processing".

C. The student will learn about computer-related career opportunities.

1. identify career fields related to computer development and use.
2. state the value of computer skills for future employment.
3. describe how computers are used by sociologists and other social scientists.
4. describe some of the ways computers are used in the information and language related careers.
5. show how a scientist would use a computer.

D. The student will: gain a nontechnical understanding of how computers function.

1. explain the basic operation of a computer system in terms of data input, processing, and data output.
2. recognize a need for data to be organized in order to be helpful.
3. define "computer program".
4. explain why a computer needs a program to operate.
5. recognize the relationship of data input to data output.
6. state what will happen if instructions are not stated in the precise language for that computer.

7. list at least three computer languages identifying the purposes for which each is used.
8. state that BASIC is the language most commonly used by microcomputers.

E. The student will: learn to use a computer.
1. become familiar with a microcomputer through its use in the laboratory.
2. use a prepared program in a microcomputer.
3. state the meaning of "algorithm".
4. explain what is being accomplished by a given algorithm.
5. follow and give correct output for a given algorithm.
6. describe the standard flow chart symbols.
7. read and explain a flow chart.
8. list several fundamental BASIC statements and commands.
9. create a simple program in BASIC.
10. use the computer to accomplish a mathematical task.
11. use the computer as a word processor.
12. use CAI.
13. use the computer for drill and practice.
14. use the computer for experimenting with new ideas.
15. use the computer for tutorial instruction.

II. Staff Involvement:

A. Present Level of Staff Training:

These lists describe the present level of faculty and staff training in terms of type and total number of hours.

Faculty/Staff Member	Type of Training	Number Hours
Teacher A	basic computer course	050 hours
Teacher B	basic computer course	045 hours
Teacher C	IBM PC and Apple 2E	030 hours
Teacher D	Apple 2E	050 hours
Teacher E	hands on	010 hours
Teacher F	Vendor Training Commodore	010 hours
Teacher G	Beginning Data Processing	050 hours
Teacher H	Radio Shack	020 hours
Staff I	Radio Shack	010 hours
Staff J	Radio Shack	010 hours
Staff K	Radio Shack	010 hours
Teacher L	Introduction to Computers	070 hours
Teacher M	OJT OU Health Science Center	2.0 years
Teacher N	college courses	050 hours
Principal	college courses computer course instruction	100 hours
Teacher P	BNC Graphix Co. (family business) Computer Aided Design (CAD)	2.5 years

total IBM compatibility

Two certified personnel have volunteered to teach in the computer laboratory during the 1986-'87 school term.

B. Plans to Alleviate Faculty Computer Training Deficiencies:

In-service on computer literacy for all staff members will be available during the 1986-'87 school term at the building site. Building personnel, the computer laboratory teacher, and IBM Corporation personnel will provide the in-service training. Staff development points will earned for computer literacy training to help teachers meet the district's requirements for point accumulation.

Arrangements will also be made for staff members to attend training sessions at the IBM Corporation offices in Oklahoma City. The in-service at IBM will consist of computer literacy, reviewing educational programs, a yearly update on trends in computer education, new programs and equipment.

C. Special Duties Assigned to Faculty in Program Implementation:

In lieu of a SAP class, the laboratory teacher will provide instruction on computer literacy to SAP classes on a rotating schedule. The teacher will also provide special in-service training and assistance to other teachers on site which will improve computer literacy throughout the staff.

III. Security and Maintenance of Laboratory Instruments:

A. Location and Storage of Software:

The laboratory selected location is room A200 located upstairs in the main building. There is one door, the entrance/exit door, into the upstairs main hallway and five windows which do not support outside ledges; however, they do support new frames and guards purchased with bond issue monies. The physical location measures 40'0" X 25'0".

The software will be stored in a locked file cabinet in room A200 during the school term. During the summer break the software will be stored in a closet located in the main office protected by a special keyed dead bolt lock.

B. Modifications to Elected Laboratory Site with Respect to Security and Maintenance Specifications:

Three modifications are necessitated for maintenance and appropriate security of room A200. The first is to install a door latch guard and special lock tumbler on the entrance/exit hallway door; secondly, a wire guard must be situated over the hallway door window. Third, electrical outlets must be installed on the floor to provide access power to terminals. Access power will include power surge protection devices. Classroom furniture will be arranged around electrical conduit in a manner which should eliminate safety hazards. Mr. Joe Tafolla and Chief Tiller have been consulted according to the guidelines outlined by the proposal; the modifications in terms of cost necessary to qualify room A200 as an acceptable site are minimal.

IV. Special Attributes of this Campus as the CAI Laboratory Local:

Faculty and staff members have a particular forte in servicing students who score below the CAT fortieth percentile ranking. This campus enrollment documents the greatest percent of student population in District I-89 ranking below the fortieth percentile. Traditionally, the faculty and staff have accepted this challenge forthright; it is ongoing in nature.

The Promise Program sustains an enrollment of gifted and talented students, members of the student body who will be welcome to use the computer laboratory in their pursuit of interests.

Additionally, suggested IBM terminals will provide compatibility for use in concurrence with main frame operations now and in the future. The results are innovative and represent tremendous monetary savings for purchase of subsequent educational software.

V. Evaluation of CAI Program Implementation:

Overall evaluation of the program will be made through analysis of results of individual student tests, questionnaires to be completed by participating teachers, and questionnaires which will be completed by parents. The head administrator is ultimately responsible for supervision of the program and will monitor the evaluation process.

All students will be given the same evaluative instrument during respective computer instruction time blocks. An item analysis can be tallied during the school term as results become available for determining the success of the instruction. (A computer program will facilitate this.) Item analysis will determine the degree of instructional success; also, it will be constructive in identifying instructional weaknesses.

At the close of the school term, teachers will be asked to complete questionnaires concerning various aspects of the program. Information will be obtained concerning the adequacy of teacher instruction, the motivation of both teachers and students, student attendance, parental involvement, clarity and concise features of laboratory curriculum, equipment reliability, and efficiency in terms of equipment arrangement. Comments and suggestions about various aspects of the laboratory will be solicited by the questionnaire. Many of the questions will solicit subjective answers but the results will be of limitless value.

A similar questionnaire will be sent to parents at the close of the school term. These questions will deal with individual motivation resulting from laboratory activities and willingness exhibited by their children to share newfound information with them. Parents will be asked to comment on the impact the laboratory experience has made in the educational genre of their children.

Based on the results of these evaluations arrangements can be made to improve the program for the ensuing school term.

References

Wares, Margaret Bond. (1971). "Use of the Computer in Individualizing Remediation at Nashville State Technical Institute". Nashville, Tennessee: Nashville State Technical Institute. (ERIC Document Reproduction Service No. ED 056846)